

## **STEM College and Career Presentations at DHS**

8<sup>th</sup> grade students enjoyed STEM College and Career Presentations at DHS on the morning of Friday, February 1st, 2013. Students participated in interactive presentations from guest speakers currently working in the fields of Science, Technology, Engineering, and Math (STEM), or pursuing college majors or graduate study in STEM fields.

Speakers from the MIT Women's Initiative conducted presentations for the girls that were specially designed to encourage them to pursue STEM study and career opportunities. The presentations demonstrated projects on which the presenters have worked and included activities designed to engage the girls in engineering concepts and expose the girls to information about the fields of engineering and the life of an engineering student. The speakers were Ms. Kat Kononov – a graduate student specializing in Electrical Engineering and Ms. Judy Rodriguez – a senior majoring in Nuclear Engineering; both students at the Massachusetts Institute of Technology (MIT). Ms. Kononov and Ms. Rodriguez explained what engineering is by giving concrete examples of engineering projects, and by showing students that the world is filled with the products of engineers. They also described various engineering fields - including aerospace, biomedical, chemical, civil, electrical, environmental, mechanical and nuclear - and shared with the Douglas students what life as an engineering student is like. They then had students identify examples of engineering around them and name the type of engineering used to create it. The young women also discussed and dispelled the stereotypes surrounding the engineering field. Finally, the 8<sup>th</sup> grade girls participated in a design challenge to engage their thinking about engineering concepts, in which they had 25 minutes to build the tallest tower they could out of 10 paper clips, 20 straws and 18 inches of tape.

While the girls were actively engaged in the MIT presentation, the 8<sup>th</sup> grade boys rotated through two shorter presentations given by professionals working in STEM fields. Two employees from Intel, Mr. David Andrews (Senior Software Engineer of Design Tools) and Ms. Marjorie Miller (Gas Systems Engineer) explained that engineering is an enjoyable profession in a good working environment, where you make a difference, earn a good salary and have flexibility. They also shared that the majority of US engineering companies actually have a shortage of engineers. They explained that engineers work in teams to solve problems using the Engineering Design Process. To simulate this key component of engineering, students were broken into small teams and given the challenge of creating a paper structure that could support one or more hard cover textbooks at least 12 inches above a flat sturdy surface for a minimum of 30 seconds. Their available materials were assigned costs, and they were additionally challenged to support the most books for the lowest price. There was at least one structure that supported 11 textbooks! To wrap things up, Mr. Andrews shared a wooden electric guitar and rubber band launcher that were made by his sons while they were in middle school. His message was that it's never too early to start engineering!

The boys also heard from two employees of EMC Corporation, Mr. Curtis Johnson (Senior Data Scientist) and Mr. Dave Vassar (Logistical Engineer). Mr. Johnson and Mr. Vassar discussed how EMC builds hard drives and data storage systems for most major companies. Students looked at small and large hard drives and discussed the increasing rate of data generation. They learned the terminology of data storage-from a byte which is the smallest amount of data storage to a yodabyte which is 1,000 zetabytes! Finally, they participated in a short design challenge in which they had to design a way to move a ball across the room using only a washer and two pieces of string.

Later in the day, the presenters from MIT and EMC Corporation were joined by Ms. Kay Kimball Gruder, from the New England Institute of Technology, in giving similar presentations to the 6<sup>th</sup> and 7<sup>th</sup> graders as part of their STEM Career Day at the IES. The goal of conducting STEM College and Career

Presentations was two-fold: to encourage all students to pursue further study in high school and college in STEM subjects, and to consider preparing for a STEM career in the future.

Douglas is one of three area school districts (the other two being Leominster and Quabog) who formed District-wide STEM Integration Teams that are working collaboratively with Dr. Mia Dubosarsky, Director of Professional Development for the STEM Education Center at WPI, to promote STEM initiatives in our districts. We have formed these teams, recognizing the growing and critical importance of STEM education to the economic well-being and quality of life in America today. In order for the United States to be successful in an increasingly global marketplace, all students must possess a working understanding of STEM content, and more students must pursue higher degrees in STEM fields and enter STEM-based careers. Acknowledging that the quality of modern life depends on innovation and development in STEM disciplines, the goal of the Douglas Public Schools STEM Integration Team is to build STEM literacy through integrating STEM subjects across all subject areas and grade levels; to prepare students with the necessary knowledge and skills to pursue further study in STEM subjects; and to encourage students to pursue careers in STEM fields.

The Douglas Public Schools STEM Integration Team members are: Beverly Bachelder, IES Principal, Jessica Findlay, Gr. 6 Math Teacher, Kathleen Gauthier, Gr. 3 Teacher, Kelly Graveson, Gr. 8 Science Teacher/Science Vertical Curriculum Team Chair, Cindy Socha, Director of Curriculum/DHS Math Dept. Chair, and Rachel Usher, Gr. 7 Science Teacher.

### **Student Comments about the STEM Presentations**

Thank you so much for having the MIT girls come in to speak about Engineering and STEM careers, it was a real eye-opener! I hope we get to have more events like that one in the future! -Kylie B.

I learned that MANY companies use equipment from EMC. The activity was entertaining and the whole experience was informative. -Matt S.

I enjoyed the Intel presentation mostly because of the activity. I learned that some engineers have to be extremely careful because some gasses explode when mixed with oxygen. I enjoyed building the book case with minimum materials-my group's could hold the most books. -Sean M.

One thing I learned from MIT presenters was that there are many different types of engineering such as nuclear, electrical, and civil. Another thing I learned was that engineering is about creativity, problem solving, math and science. I thought the presentation was inspiring and educational, it taught me many things about engineering. -Katelyn L.

**Thank you to all of the STEM College and Career Presenters!**

## Images from the MIT Women's Initiative Presentation

Kat Kononov, Electrical Engineering student  
Judy Rodriguez, Nuclear Engineering student



**Massachusetts  
Institute of  
Technology**



**WOMEN'S INITIATIVE**  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

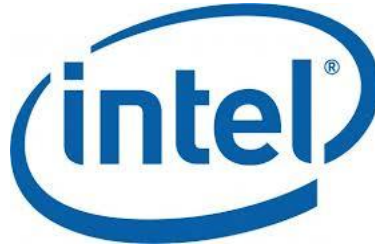


(Top left) 8<sup>th</sup> grade girls in the early stages of tower building; (Top right) Kat and Judy speak to the girls about the fact that engineering students CAN have social lives; (Bottom left) Meredith Roberts is happy to be participating in the presentation; (Bottom right) One group of girls wonder if their tower will remain standing.

## Images from the Intel Presentation

David Andrews, Senior Software Engineer of Design Tools

Marjorie Miller, Gas Systems Engineer



(Top left) Mr. David Andrews displays the electric guitar his son made in middle school; (Top right) Ms. Miller and Mr. Andrews explain what engineers do; (Bottom 3 photos) 8<sup>th</sup> grade boys test various designs for supporting textbooks.

## Images from the EMC Corporation Presentation

Curtis Johnson, Senior Data Scientist

Dave Vassar, Logistical Engineer



(Above left) Curtis Johnson and Dave Vassar discuss EMC's many data storage systems; (Above right) 8<sup>th</sup> grade boys enjoy Mr. Johnson's and Mr. Vassar's sense of humor.